

REMARKS

Claims 2 and 6-9 are all the claims pending in the application. Claims 2, 6, and 7 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed invention. Claims 2 and 6-9 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly not being enabled. Claim 2 is also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 6-9 are rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Asano (U.S. Patent No. 5,188,297), as previously indicated in the Office Action of April 19, 2002. Also, the Examiner maintains that claim 2 is unpatentable over Bata (U.S. Patent 5,427,319) under 35 U.S.C. § 103(a), as set forth in the previous Office Action of April 19, 2002.

§ 112, first paragraph, Rejections – Claims 2, 6, and 7

The Examiner rejects claims 2, 6, and 7 under § 112, first paragraph, for the reasons set forth on page 2 of the Office Action.

With respect to the § 112, first paragraph, rejection of claim 2, the Examiner states that “Figure 1 shows portions of sleeve 17 which are closer to the needle valve than the portion which is attached to the elastic member 18. Therefore, the disclosure, as originally filed, appears to contradict the claimed invention.” *See page 2 of Office Action.* In response, Applicant submits that the Examiner appears to misunderstand claim 2. That is, Applicant submits that claim 2, as examined by the Examiner, clearly describes that an end portion of a coil is nearest to a needle valve, which is contrary to the Examiner’s apparent belief that the claim describes that

the portion of the sleeve 17 that the elastic member is attached to is nearest to the needle valve. In any event, in an effort to advance prosecution, Applicant amends claim 2, as indicated herein, to further clarify this claim, and submits that this amendment obviates the § 112, first paragraph, rejection of claim 2.

With respect to independent claims 6 and 7, the Examiner states that the disclosure does not appear to provide support for the following limitation: “wherein substantially all of said buffer portion contacts fuel in said fuel passage.” In response, Applicant submits that the subject matter of this limitation is supported by at least Fig. 1. That is, Fig. 1 clearly shows a buffer portion 18 wherein at least 3 of its sides contact a fuel passage. Therefore, at least Fig. 1 shows that substantially all of said buffer portion contacts fuel in said fuel passage. Thus, at least based on the foregoing, Applicant respectfully requests that the Examiner withdraw his § 112, first paragraph, rejections of claims 6 and 7.

§ 112, first paragraph, Rejections (Enablement) – Claims 2 and 6-9

With respect to the § 112, first paragraph, rejections of claims 2 and 6-9 as set forth in paragraph 5 of the Office Action, Applicant amends claims 2 and 6-9, as set forth in the attached Appendix, and submits that these amendments obviate the § 112, first paragraph, rejections of claims 2 and 6-9, as set forth in paragraph 5 of the Office Action.¹ The amendments to claims 2 and 6-9 are being made for clarification purposes only.

¹ Applicant submits, contrary to the Examiner’s argument on page 3 of the Office Action, that claim 2, as examined, did not indicate that the needle valve, armature and solenoid are not components of the fuel injection valve.

§ 112, second paragraph, Rejections – Claim 2

To support the § 112, second paragraph, rejection of claim 2, the Examiner states that “a coil”, as recited in line 10 of claim 2, appears to be a double inclusion of the “solenoid” recited in line 2 of claim 2. In response, Applicant submits that the claimed coil is not a double inclusion of the solenoid, as the terms coil and solenoid refer to different elements. For example, in Fig. 1, the coil corresponds to element 6 and the solenoid corresponds to element 2. Thus, the coil and solenoid are, in fact, different elements, and the coil is not a double inclusion of the solenoid.

§ 102 Rejections (Asano) – Claims 6-9

The Examiner maintains the same rejections of claims 6-9 under § 102 as set forth in the previous Office Action of April 19, 2002, and provides further support for the rejections in the *Response to Arguments* section of page 5 of the Office Action.

In response, with respect to independent claims 6 and 7, Applicant maintains that Asano does not teach or suggest at least “wherein substantially all of said buffer portion contacts fuel in said fuel passage,” as set forth in claims 6 and 7. Applicant points out that this argument was made in the previous Amendment of July 19, 2002, but the Examiner never even addresses or mentions this limitation or Applicant’s related arguments submitted in the previous Amendment dated July 19, 2002. Therefore, at least since the Examiner has not shown that Asano discloses all of the limitations of claims 6 and 7, including the limitation quoted above, Applicant requests that the Examiner withdraw the rejections of claims 6 and 7 under § 102.

Further, with respect to the present invention, as recited in claims 6 and 7, according to Fig. 1 of the present invention, the sealing member is disposed at a lower pressure side with respect to the elastic member (O-ring) and thus the elastic member is placed in such a condition that the fuel pressure is exerted to the elastic member at the peripheral portion of the buffer portion (thus, “substantially all of said buffer portion contacts fuel in said fuel passage”). Thus, for example, a result of the claimed invention is that a damping of the pulsational pressure change can be damped utilizing elastic deformation of the entire surface of the elastic member.

On the other hand, because the structure according to Asano employs the elastic member for sealing, the elastic member of Asano is placed in the condition that it is pushed toward the member (40). Thus, even if, *assuming arguendo*, the elastic member of Asano performs a damping function, only a small part of the surface of the elastic member can be utilized for the purpose of damping of pressure change. Therefore, Asano clearly does not satisfy at least the claimed limitation “wherein substantially all of said buffer portion contacts fuel in said fuel passage,” as recited in claims 6 and 7.

With respect to claims 8 and 9, Applicant maintains the arguments presented in the previous Amendment of July 19, 2002. That is, Applicant submits that Asano does not teach or suggest at least “means for damping a change of fuel pressure caused by valve bounce when the needle is closed, as recited in claims 8 and 9. *See pages 6-7 of July 19 Amendment.*

§ 103(a) Rejection (Bata) – Claim 2

With respect to the § 103(a) rejection of claim 2, the Examiner appears to admit that Bata does not disclose the limitation “said elastic member being attached to a portion of said sleeve located near an end portion of the solenoid, said end portion of said coil being the end portion nearest to said needle valve,” as recited in claim 2. However, the Examiner alleges that “Bata shows O-rings in multiple locations. Providing an elastic member being attached to a portion of said sleeve located near an end portion of a coil which is nearest to said needle valve is a mere relocation of parts. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have relocated the O-ring of Bata to provide a seal earlier in the fluid flow to reduce fuel contact.” *See pages 4-5 of Office Action.*

In response, first, Applicant submits that Bata does not show “multiple locations” of O-rings. That is, in the picture in the Office Action, Bata only appears to show the alleged O-ring as being located directly below, and attached to that which is labeled a sleeve. Multiple locations of O-rings are not shown anywhere in the disclosure of Bata. Further, Applicant submits that the Examiner has used impermissible hindsight reasoning in concluding that one having ordinary skill in the art would have been led to relocate the alleged O-ring of Bata to the position described in the quoted limitation in the paragraph above. That is, nowhere in Bata is there a teaching, suggestion, or motivation to modify Bata as recited in claim 2, and the Examiner has not provided any evidence to support his assertion. Thus, at least based on the foregoing, Applicant submits that the Examiner has not sufficiently shown that modifying Bata to reflect the limitations of claim 2 would have been obvious. Therefore, Applicant submits that, absent

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impermissible hindsight reasoning, Applicant's invention, as recited in claim 2, is non-obvious over Bata.

Further, with respect to claim 2, an example of a result of the present invention, as recited in claim 2, is that a pressure wave acting on to the end face of armature (8) can be controlled. Bata, on the other hand, shows the portion having the elastic member at a position being relatively distant from an end face of the armature. Therefore, Bata is clearly different from claim 2 in this regard.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

2. (Six-times Amended) A fuel injection valve for opening and closing a needle valve by driving an armature with a solenoid, said fuel injection valve comprising:

said needle valve;

said armature;

said solenoid; and

a buffer portion damping a change of fuel pressure caused by valve bounce when the needle is closed, said buffer portion being an elastic member disposed at a position at which said buffer portion faces and contacts a fuel passage located at an upstream side with respect to an end face of said armature located on a side of a nozzle opening side,

wherein said elastic member is provided between a sleeve and said core in order to form said buffer portion, said sleeve being disposed between a core and a valve holder of the solenoid, said elastic member being attached to a portion of said sleeve located near an end portion of a coil, ~~which is said end portion of said coil being the end portion~~ nearest to said needle valve, and said elastic member extending in a perpendicular direction away from said sleeve toward said core.

6. (Four-times Amended) A fuel injection valve for opening and closing a needle valve by driving an armature with a solenoid, said fuel injection valve comprising:

said needle valve;

said armature;

said solenoid; and

a buffer portion damping a change of fuel pressure caused by valve bounce when the needle is closed, said buffer portion being an elastic member disposed at a position at which said buffer portion faces and contacts a fuel passage located at an upstream side with respect to an end face of said armature located on a side of a nozzle opening side,

wherein substantially all of said buffer portion contacts fuel in said fuel passage.

7. (Four-times Amended) A fuel injection valve for opening and closing a needle valve by driving an armature with a solenoid, said fuel injection valve comprising:

said needle valve;

said armature;

said solenoid; and

a buffer portion damping a change of fuel pressure caused by valve bounce when the needle is closed, said buffer portion being an elastic member disposed at a position at which said buffer portion faces and contacts a fuel passage located at an upstream side with respect to an end face on a nozzle opening side of said armature,

wherein substantially all of said buffer portion contacts fuel in said fuel passage.

8. (Twice Amended) A fuel injection valve for opening and closing a needle valve by driving an armature with a solenoid, said fuel injection valve comprising:

said needle valve;

said armature;

said solenoid; and

means for damping a change of fuel pressure caused by valve bounce when the needle is closed, said means being an elastic member disposed at a position at which said means faces and contacts a fuel passage located at an upstream side with respect to an end face of said armature located on a side of a nozzle opening side.

9. (Twice Amended) A fuel injection valve for opening and closing a needle valve by driving an armature with a solenoid, said fuel injection valve comprising:

said needle valve;

said armature;

said solenoid; and

means for damping a change of fuel pressure caused by valve bounce when the needle is closed, said means being an elastic member disposed at a position at which said means faces and contacts a fuel passage located at an upstream side with respect to an end face on a nozzle opening side of said armature.